CLAIMS

1. A method for using an apparatus to induct articles onto a conveyor comprising at least one conveyor belt that moves articles along a first path that extends in a first direction, the method comprising steps of:

(a) using the apparatus to move a first article along a second path that extends in a second direction, which is transverse to the first direction, to a first position above but not in contact with the at least one conveyor belt; and

(b) after the first article has been moved to the first position above but not in contact with the at least one conveyor belt, using the apparatus to move the first article onto the at least one conveyor belt.

2. The method of claim 1, wherein the second direction is substantially perpendicular to the first direction.

3. The method of claim 1, wherein the at least one conveyor belt comprises at least two parallel belts that carry articles along the first path.

4. The method of claim 3, wherein:

the step (a) further comprises using at least one roller disposed between the at least two parallel belts to move the first article to the first position above but not in contact with the at least two parallel belts; and

the step (b) further comprises lowering the at least one roller below an upper plane formed by the at least two parallel belts so that the first article is moved onto the at least two parallel belts.

5. The method of claim 1, wherein the step (a) comprises using a plurality of rollers to move the first article to the first position above but not in contact with the at least one conveyor belt.

6. The method of claim 1, further comprising steps of:

(c) using the apparatus to move a second article along a third path that extends in a third direction, which is transverse to the first direction, to a second position above but

not in contact with the at least one conveyor belt, the second position being upstream of the first position; and

(d) after the second article has been moved to the second position above but not in contact with the at least one conveyor belt, using the apparatus to move the second article onto the at least one conveyor belt.

7. The method of claim 6, wherein:

the step (a) comprises using a first plurality of rollers to move the first article to the first position above but not in contact with the at least one conveyor belt; and

the step (c) comprises using a second plurality of rollers to move the second article to the second position above but not in contact with the at least one conveyor belt.

8. The method of claim 1, further comprising a step of:

(c) moving the at least one conveyor belt such that inducted articles are moved along the first path at a speed of at least 180 feet per minute.

9. The method of claim 1, further comprising a step of:

(c) moving the at least one conveyor belt such that articles pass at least one point along the first path at a rate greater than 30 articles per minute.

10. The method of claim 1, further comprising a step of:

(c) moving the at least one conveyor belt such that articles pass at least one point along the first path at a rate of at least 60 articles per minute.

11. The method of claim 1, further comprising a step of:

(c) using the apparatus to divert at least one article from the at least one conveyor belt at a second position that is upstream of the first position.

12. The method of claim 1, wherein the apparatus further comprises at least one sensor and at least one controller, and wherein the method further comprises a step of:

(c) using the at least one controller to monitor an output of the at least one sensor to determine whether sufficient room exists between successive articles on the at least one conveyor belt to induct the first article therebetween; and

(d) performing the steps (a) and (b) in response to the at least one controller determining that sufficient room exists between successive articles on the at least one conveyor belt to induct the first article therebetween.

13. The method of claim 12, wherein the steps (c) and (d) are performed such that, at least for articles of less than a certain length, at least a minimum gap is maintained between the first article and each of the successive articles between which the first article is inducted.

14. The method of claim 1, further comprising a step of:

(c) using the apparatus to induct at least one article onto the at least one conveyor belt at a location upstream of the first position.

15. A method for using an apparatus to induct articles onto at least one conveyor belt that moves articles along a first path extending in a first direction at least between first and second points, comprising steps of:

(a) using the apparatus to move a first article along a second path that extends in a second direction, which is substantially perpendicular to the first direction, so that the first article is positioned adjacent the first path at a first location between the first and second points; and

(b) after the first article has been positioned adjacent the first path at the first location, using the apparatus to move the first article onto the at least one conveyor belt.

16. The method of claim 15, wherein the at least one conveyor belt comprises at least two parallel belts that carry articles along the first path.

17. The method of claim 16, wherein the step (b) comprises:

using at least one roller disposed between the at least two parallel belts to move the first article to a position above but not in contact with the at least two parallel belts; and

lowering the at least one roller below an upper plane formed by the at least two parallel belts so that the first article is moved onto the at least two parallel belts.

18. The method of claim 15, wherein the step (a) comprises using a plurality of rollers to move the first article so that the first article is positioned adjacent the first path at the first location.

19. The method of claim 15, further comprising steps of:

(c) using the apparatus to move a second article along a third path that extends in a third direction, which is substantially perpendicular to the first direction, so that the second article is positioned adjacent the first path at a second location between the first and second points, the second location being upstream of the first location; and

(d) after the second article has been positioned adjacent the first path at the second location, using the apparatus to move the second article onto the at least one conveyor belt.

20. The method of claim 19, wherein:

the step (a) comprises using a first plurality of rollers to move the first article along the second path so that the first article is positioned adjacent the first path at the first location; and

the step (c) comprises using a second plurality of rollers to move the second article along the third path so that the second article is positioned adjacent the first path at the second location.

21. The method of claim 15, further comprising a step of:

(c) moving the at least one conveyor belt such that inducted articles are moved along the first path at a speed of at least 180 feet per minute.

22. The method of claim 15, further comprising a step of:

(c) moving the at least one conveyor belt such that articles pass at least one point along the first path at a rate greater than 30 articles per minute.

23. The method of claim 15, further comprising a step of:

(c) moving the at least one conveyor belt such that articles pass at least one point along the first path at a rate of at least 60 articles per minute.

24. The method of claim 15, further comprising a step of:

(c) diverting at least one article from the at least one conveyor belt at a second location that is upstream of the first location.

25. The method of claim 15, wherein the apparatus comprises at least one sensor and at least one controller, and wherein the method further comprises a step of:

(c) using the at least one controller to monitor an output of the at least one sensor to determine whether sufficient room exists between successive articles on the at least one conveyor belt to induct the first article therebetween; and

(d) performing the step (b) in response to the at least one controller determining that sufficient room exists between successive articles on the at least one conveyor belt to induct the first article therebetween.

26. The method of claim 25, wherein the steps (c) and (d) are performed such that, at least for articles of less than a certain length, at least a minimum gap is maintained between the first article and each of the successive articles between which the first article is inducted.

27. The method of claim 15, further comprising a step of:

(c) using the apparatus to induct at least one article onto the at least one conveyor belt at a second location that is upstream of the first location.

28. A method for using an apparatus to induct articles onto a belt conveyor comprising at least two parallel belts that carry the articles along a first path extending in a first direction, comprising steps of:

(a) using the apparatus to move a first article along a second path that extends in a second direction, which is transverse to the first direction, so that the first article is positioned adjacent the first path at a first location; and

(b) after the first article has been positioned adjacent the first path at the first location, using the apparatus to move the first article onto the belt conveyor.

29. The method of claim 28, wherein the step (b) comprises:

using at least one roller disposed between the at least two parallel belts to move the first article to a first position above but not in contact with the at least two parallel belts; and

lowering the at least one roller below an upper plane formed by the at least two parallel belts so that the first article is moved onto the belt conveyor.

30. The method of claim 28, wherein the step (a) comprises using a plurality of rollers to move the first article along the second path so that the first article is positioned adjacent the first path at the first location.

31. The method of claim 28, further comprising steps of:

(c) using the apparatus to move a second article along a third path that extends in a third direction, which is transverse to the first direction, so that the second article is positioned adjacent the first path at a second location, the second location being upstream of the first location; and

(d) after the second article has been positioned adjacent the first path at the second location, using the apparatus to move the second article onto the belt conveyor.

32. The method of claim 31, wherein:

the step (a) comprises using a first plurality of rollers to move the first article along the second path so that the first article is positioned adjacent the first path at the first location; and

the step (c) comprises using a second plurality of rollers to move the second article along the third path so that the second article is positioned adjacent the first path at the second location.

33. The method of claim 28, further comprising a step of:

(c) operating the belt conveyer such that inducted articles are moved along the first path at a speed of at least 180 feet per minute.

34. The method of claim 28, further comprising a step of:

(c) operating the belt conveyer such that articles pass at least one point along the first path at a rate greater than 30 articles per minute.

35. The method of claim 28, further comprising a step of:

(c) operating the belt conveyer such that articles pass at least one point along the first path at a rate of at least 60 articles per minute.

36. The method of claim 28, further comprising a step of:

(c) using the apparatus to divert at least one article from the belt conveyor at a second location that is upstream of the first location.

37. The method of claim 28, wherein the apparatus comprises at least one sensor and at least one controller, and wherein the method further comprises a step of:

(c) using the at least one controller to monitor an output of the at least one sensor to determine whether sufficient room exists between successive articles on the belt conveyor to induct the first article therebetween; and

(d) performing the step (b) in response to the at least one controller determining that sufficient room exists between successive articles on the belt conveyor to induct the first article therebetween.

38. The method of claim 37, wherein the steps (c) and (d) are performed such that, at least for articles of less than a certain length, at least a minimum gap is maintained between the first article and each of the successive articles between which the first article is inducted.

39. The method of claim 28, further comprising a step of:

(c) using the apparatus to induct at least one article onto the belt conveyor at a second location that is upstream of the first location.

40. An apparatus, comprising:

at least one conveyor belt configured and arranged to carry articles along a first path that extends in a first direction; and

a first conveyor system configured and arranged to move first articles along a second path that extends in a second direction, which is transverse to the first direction, to a first position above but not in contact with the at least one conveyor belt, the first conveyor system being further configured and arranged to move the first articles onto the at least one

conveyor belt after the first articles have been moved to the first position above but not in contact with the at least one conveyor belt.

41. The apparatus of claim 40, wherein the second direction is substantially perpendicular to the first direction.

42. The apparatus of claim 40, wherein the at least one conveyor belt comprises at least two parallel belts that carry articles along the path.

43. The apparatus of claim 42, wherein the first conveyor system comprises at least one roller disposed between the at least two parallel belts, the at least one roller being configured and arranged to move the first articles to the first position above the at least two parallel belts, and being further configured and arranged to be moved below an upper plane formed by the at least two parallel belts to thereby move the first articles onto the at least two parallel belts.

44. The apparatus of claim 40, wherein the first conveyor system comprises a plurality of rollers configured and arranged to move the first articles to the first position above the at least one conveyor belt.

45. The apparatus of claim 40, further comprising:

a second conveyor system configured and arranged to move second articles to a second position above but not in contact with the at least one conveyor belt and to move the second articles onto the at least one conveyor belt after the second articles have been moved to the second position above but not in contact with the at least one conveyor belt, the second position being upstream of the first position.

46. The apparatus of claim 45, wherein:

the first conveyor system comprises a first plurality of rollers configured and arranged to move the first articles to the first position above the at least one conveyor belt; and

the second conveyor system comprises a second plurality of rollers configured and arranged to move the second articles to the second position above the at least one conveyor belt.

47. The apparatus of claim 40, wherein the at least one conveyor belt is configured and arranged to move articles along the first path at a speed of at least 180 feet per minute.

48. The apparatus of claim 40, wherein the at least one conveyor belt is configured and arranged to move articles along the first path such that articles are caused to pass at least one point along the first path at a rate greater than 30 articles per minute.

49. The apparatus of claim 40, wherein the at least one conveyor belt is configured and arranged to move articles along the first path such that articles are caused to pass at least one point along the first path at a rate of at least 60 articles per minute.

50. The apparatus of claim 40, further comprising:

a second conveyor system configured and arranged to divert articles from the at least one conveyor belt at a location upstream of the first position.

51. The apparatus of claim 40, wherein the apparatus further comprises at least one sensor and at least one controller, the at least one sensor being configured and arranged to monitor articles on the at least one conveyor belt, and the at least one controller being configured to monitor an output of the at least one sensor to determine whether sufficient room exists between successive articles on the at least one conveyor belt to induct a first article therebetween, and to cause the first conveyor system to induct a first article onto the at least one conveyor belt in response to determining that sufficient room exists between the successive articles.

52. The apparatus of claim 51, wherein the at least one controller is configured to cause first articles to be inducted between successive articles such that, at least for articles of less than a certain length, at least a minimum gap is maintained between each

inducted first article and each of the articles between which the inducted first article is inducted.

53. The apparatus of claim 40, further comprising at least one induction device configured and arranged to induct articles onto the at least one conveyor belt at a location upstream of the first position.

54. An apparatus, comprising:

at least one conveyor belt that moves articles along a first path extending in a first direction at least between first and second points; and

a first conveyor system configured and arranged to move first articles along a second path that extends in a second direction, which is substantially perpendicular to the first direction, so that the first articles are positioned adjacent the first path at a first location between the first and second points, the first conveyor system being further configured and arranged to move the first articles onto the at least one conveyor belt after the first articles have been positioned adjacent the first path at the first location.

55. The apparatus of claim 54, wherein the at least one conveyor belt comprises at least two parallel belts that carry articles along the first path.

56. The apparatus of claim 55, wherein the first conveyor system further comprises at least one roller disposed between the at least two parallel belts, the at least one roller being configured and arranged to move the first articles to a first position above but not in contact with the at least two parallel belts, and being further configured and arranged to be moved below an upper plane formed by the at least two parallel belts to thereby move the first articles onto the at least two parallel belts.

57. The apparatus of claim 54, wherein the first conveyor system comprises a plurality rollers configured and arranged to move the first articles so that the first articles are positioned adjacent the first path at the first location.

58. The apparatus of claim 54, further comprising:

a second conveyor system configured and arranged to move second articles along a third path that extends in a third direction, which is substantially perpendicular to the first direction, so that the second articles are positioned adjacent the first path at a second location between the first and second points, the second location being upstream of the first location, the second conveyor system being further configured and arranged to move the second articles onto the at least one conveyor belt after the second articles have been positioned adjacent the first path at the second location.

59. The apparatus of claim 58, wherein:

the first conveyor system comprises a first plurality of rollers configured and arranged to move the first articles along the second path so that the first articles are positioned adjacent the first path at the first location; and

the second conveyor system comprises a second plurality of rollers configured and arranged to move the second articles along the third path so that the second articles are positioned adjacent the first path at the second location.

60. The apparatus of claim 54, wherein the at least one conveyor belt is configured and arranged such that inducted articles are moved along the first path at a speed of at least 180 feet per minute.

61. The apparatus of claim 54, wherein the at least one conveyor belt is configured and arranged such that articles are caused to pass at least one point along the first path at a rate greater than 30 articles per minute.

62. The apparatus of claim 54, wherein the at least one conveyor belt is configured and arranged such that articles are caused to pass at least one point along the first path at a rate of at least 60 articles per minute.

63. The apparatus of claim 54, further comprising:

a second conveyor system configured and arranged to divert articles from the at least one conveyor belt at a second location that is upstream of the first location.

64. The apparatus of claim 54, further comprising at least one sensor and at least one controller, the at least one sensor being configured and arranged to monitor articles on the at least one conveyor belt, and the at least one controller being configured to monitor an output of the at least one sensor to determine whether sufficient room exists between successive articles on the at least one conveyor belt to induct a first article therebetween, and to cause the first conveyor system to induct a first article onto the at least one conveyor belt in response to determining that sufficient room exists between the successive articles.

65. The apparatus of claim 64, wherein the at least one controller is configured to cause first articles to be inducted between successive articles such that, at least for articles of less than a certain length, at least a minimum gap is maintained between each inducted first article and each of the articles between which the inducted first article is inducted.

66. The apparatus of claim 54, further comprising at least one induction device configured and arranged to induct articles onto the at least one conveyor belt at a second location that is upstream of the first location.

67. An apparatus, comprising:

a belt conveyor comprising at least two parallel belts that carry articles along a first path extending in a first direction at least between first and second points; and

a first conveyor system configured and arranged to move first articles along a second path that extends in a second direction, which is transverse to the first direction, so that the first articles are positioned adjacent the first path at a first location between the first and second points, the first conveyor system being further configured and arranged to move the first articles onto the belt conveyor after the first articles have been positioned adjacent the first path at the first location.

68. The apparatus of claim 67, wherein the first conveyor system comprises at least one roller disposed between the at least two parallel belts, the at least one roller being configured and arranged to move the first articles to a position above but not in contact with the at least two parallel belts, and being further configured and arranged to be moved below

an upper plane formed by the at least two parallel belts to thereby move the first articles onto the at least two parallel belts.

69. The apparatus of claim 67, wherein the first conveyor system comprises a first plurality of rollers configured and arranged to move the first articles along the second path so that the first articles are positioned adjacent the first path at the first location.

70. The apparatus of claim 67, further comprising:

a second conveyor system configured and arranged to move second articles along a third path that extends in a third direction, which is transverse to the first direction, so that the second articles are positioned adjacent the first path at a second location between the first and second points, the second location being upstream of the first location, the second conveyor system being further configured and arranged to move the second articles onto the belt conveyor after the second articles have been positioned adjacent the first path at the second location.

71. The apparatus of claim 70, wherein:

the first conveyor system comprises a first plurality of rollers configured and arranged to move the first articles along the second path so that the first articles are positioned adjacent the first path at the first location; and

the second conveyor system comprises a second plurality of rollers configured and arranged to move the second articles along the third path so that the second articles are positioned adjacent the first path at the second location.

72. The apparatus of claim 67, wherein the belt conveyor is configured and arranged to move articles along the first path at a speed of at least 180 feet per minute.

73. The apparatus of claim 67, wherein the belt conveyor is configured and arranged to move articles along the first path such that articles are caused to pass at least one point along the first path at a rate greater than 30 articles per minute.

74. The apparatus of claim 67, wherein the belt conveyor is configured and arranged to move articles along the first path such that articles are caused to pass at least one point along the first path at a rate of at least 60 articles per minute.

75. The apparatus of claim 67, further comprising:

a second conveyor system configured and arranged to divert articles from the belt conveyor at a second location that is upstream of the first location.

76. The apparatus of claim 67, wherein the apparatus further comprises at least one sensor and at least one controller, the at least one sensor being configured and arranged to monitor articles on the belt conveyor, and the at least one controller being configured to monitor an output of the at least one sensor to determine whether sufficient room exists between successive articles on the belt conveyor to induct a first article therebetween, and to cause the first conveyor system to induct a first article onto the belt conveyor in response to determining that sufficient room exists between the successive articles.

77. The apparatus of claim 76, wherein the at least one controller is configured to cause first articles to be inducted between successive articles such that, at least for articles of less than a certain length, at least a minimum gap is maintained between each inducted first article and each of the articles between which the inducted first article is inducted.

78. The apparatus of claim 67, further comprising at least one induction device configured and arranged to induct articles onto the belt conveyor at a second location that is upstream of the first location.

79. An apparatus, comprising:

means for carrying articles along a path; and

means for inducting first articles onto the means for carrying by moving the first articles to a first position above but not in contact with the means for carrying and then moving the first articles onto the means for carrying.

80. The apparatus of claim 79, further comprising:

a conveyor system configured and arranged to divert articles from the means for carrying at a location upstream of the first position.

81. The apparatus of claim 79, further comprising means for controlling the induction of the first articles onto the means for carrying such that, at least for articles of less than a certain length, at least a minimum gap is maintained between articles on the means for carrying.

82. The apparatus of claim 79, further comprising at least one induction device configured and arranged to induct articles onto the means for carrying at a location upstream of the first position.